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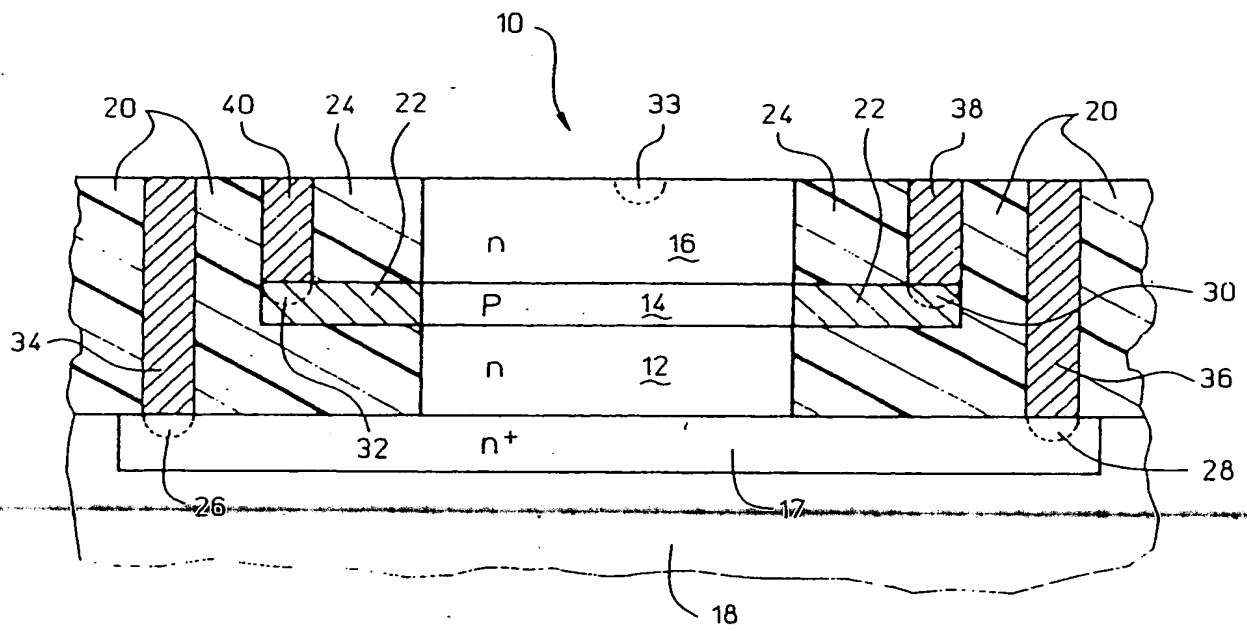
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(54) Method of fabricating an ultra-thin active region for high speed semiconductor devices.

(57) A method of fabricating a semiconductor device (10) to retard diffusion of a dopant from a center active region (14) into adjacent regions. The center active region is epitaxially formed by selectively increasing and decreasing an introduction of diffusion-suppressing material, preferably germanium, into a semiconductor material, preferably silicon, so that a vertical profile of the content of the diffusion-suppressing material is such that outdiffusion of a dopant is minimized. One embodiment of the tailoring is to increase the concentration of the diffusion-

suppressing material at both of the opposed sides of a base region of a bipolar transistor, thereby providing concentration peaks at the interfaces of the base region with collector (12) and emitter (14) regions. The concentration of germanium in a  $\text{Si}_{1-x}\text{Ge}_x$  layer is such that the value  $x$  is within the range 0.08 to 0.35 and optimally within the range 0.15 to 0.31. The dopant, preferably boron, also has a tailored concentration profile to minimize outdiffusion. A thinner, more highly doped active region is thereby achieved.

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**FIG 1**



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## EUROPEAN SEARCH REPORT

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EP 92 31 1671

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 31 May 1995	Examiner Visentin, A
<b>CATEGORY OF CITED DOCUMENTS</b> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document  T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons  & : member of the same patent family, corresponding document			



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The present search report has been drawn up for all claims			
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